WHAT IS CLAIMED IS:

1. A microporous halopolymer membrane comprising:

a first surface and a second surface and a thickness defined by the first and second surfaces, the membrane having a critical wetting surface tension (CWST) of at least about 40 dynes/cm (.40 erg/mm^2) through the thickness of the membrane, a wetting/dewetting ratio of at least about .7 for 2 or more cycles, and wherein at least one surface has a fluorine/carbon (F/C) ratio of about 1.2 or more.

2. A microporous halopolymer membrane comprising:

a first surface and a second surface and a thickness defined by the first and second surfaces, wherein at least one surface has a F/C ratio of about 1.2 or more, the membrane having a wetting/dewetting ratio of at least about .7 for 2 or more cycles, and a low level of extractables.

3. The microporous halopolymer membrane of claim 2, having a CWST of at least 26 dynes/cm (.26 erg/mm^2) through the thickness of the membrane.

4. The microporous halopolymer membrane of claim 3, having a CWST of at least about 40 dynes/cm (.40 erg/mm^2).

5. The microporous halopolymer membrane any one of claims 1-4, having a water bubble point of at least about 33 psi.

6. A porous halopolymer membrane comprising:

a first surface and a second surface and a thickness defined by the first and second surfaces, the membrane having a CWST of at least about 40 dynes/cm (.40 erg/mm^2) through the thickness of the membrane, and a wetting/dewetting ratio of at least about .7 for 2 or more cycles.

7. The halopolymer membrane of any one of claims 1-6, having a nominal pore size in the range of from about 0.02 to about 0.1 microns.

8. The halopolymer membrane of any one of claims 1-7, having a CWST of at least about 45 dynes/cm (.45 erg/mm^2) through the thickness of the membrane.

9. The halopolymer membrane of claim 8, having a CWST of at least about 58 dynes/cm (.58 erg/mm^2).

10. The halopolymer membrane of any one of claims 1-9, having a water bubble point of at least about 45 psi (about 310 kPa).

11. The halopolymer membrane of any one of claims 1-10, having a water bubble point of at least about 75 psi (about 516.8 kPa).

12. The halopolymer membrane of any one of claims 1-11, wherein the halopolymer comprises a fluoropolymer.

13. The halopolymer membrane of claim 12, wherein the fluoropolymer comprises PTFE.

14. The halopolymer membrane of any one of claims 1-13, which resists dewetting when contacted with hot water as a degassing fluid.

15. The halopolymer membrane of any one of claims 1-15, wherein at least one surface has an oxygen/carbon (O/C) ratio of about 0.15 or less.

16. The halopolymer membrane of any one of claims 1-15, having less than about 100 ppb extractable matter.

17. The halopolymer membrane of any one of claims 1-16, having less than about 30 ppb metal extractable matter.

18. The halopolymer membrane of any one of claims 1-17, having less than about 15 ppb metal extractable matter.

19. A method for producing a porous halopolymer membrane comprising:

exposing a porous halopolymer membrane to non-coherent UV radiation to produce a porous halopolymer membrane comprising a first surface and a second surface and a thickness defined by the first and second surfaces, the membrane having a CWST of at least 26 dynes/cm (.26 erg/mm^2) through the thickness of the membrane, a water bubble point of

at least about 33 psi, a wetting/dewetting ratio of at least about .7 for 2 or more cycles, and wherein at least one surface has a fluorine/carbon (F/C) ratio of about 1.2 or more.

20. A method for producing a porous halopolymer membrane comprising:

contacting a porous halopolymer membrane with a liquid to provide a liquid-treated membrane; and

exposing the liquid-treated membrane to non-coherent UV radiation.

21. The method of claim 20, wherein the liquid-treated membrane is exposed to non-coherent UV radiation two or more times.

22. The method of claim 20 or 21, wherein the non-coherent UV radiation has a wavelength in the range of from about 140 to about 350 nm.

23. The method of any one of claims 20-22, wherein contacting the porous halopolymer membrane with a liquid includes contacting the membrane with a first and a second, and optionally a third, liquid.

24. The method of claim 23, wherein the first, second, and optional third liquids are different.

25. The method of any one of claims 20-22, wherein contacting the porous halopolymer membrane with a liquid comprises immersing the membrane in the liquid; and

exposing the liquid-treated membrane to non-coherent UV radiation comprises exposing the membrane to radiation while the membrane is immersed in the liquid.

26. The method of any one of claims 19-25, wherein the non-coherent UV radiation is blackbody radiation.

27. The method of any one of claims 19-26, wherein the non-coherent UV radiation is high power radiation.

28. The method of any one of claims 19-27, wherein the non-coherent UV radiation is vacuum UV radiation.

29. The method of any one of claims 19-28, wherein the halopolymer membrane comprises a fluoropolymer.

30. The method of claim 29, wherein the fluoropolymer comprises PTFE.

31. A porous halopolymer membrane produced by exposing a porous halopolymer membrane to non-coherent UV radiation according to any of claims 19-30.

32. A process for treating a fluid comprising contacting the membrane of any of claims 1-18 and 31 with the fluid for treating and recovering the treated fluid.

33. The process of claim 32, wherein the fluid for treating is a degassing fluid.